

principal modifications of the Saurian type, as exemplified in the Crocodilian and Lacertine species; and he points out many particulars in which the *Plesiosaurus* deviates from the Loricata, and corresponds with the Lacertine or Squamate group. Amongst these may be noticed, the predominance of the elongated form in the cranial bones, extending from point to point with wide interspaces, and giving to the osseous fabric of the head the appearance of a scaffolding; the posterior bifurcation, mesial crista, and foramen of the parietal bone; the form and relative position of the posterior frontals, and especially the absence of the ridge which, in the Crocodile, extends like a second zygoma longitudinally across the zygomatic cavity. Mr. Owen further dwelt upon the form and position of the zygomatic portion of the temporal bone, the bony interspace of the external nostrils, the structure of the lower jaw, and particularly on the existence of a wide space on each side of the posterior region of the skull, bounded above by the arch formed by the bifurcate processes of the parietal and the tympanic bones, and opening into the temporal fossæ, as evidences of the affinity of the *Plesiosaurus* to the Lacertine Sauria. The correspondence of the cranial organization of the *Plesiosaurus* to those of the Crocodile, was noticed in the strength of the maxillary apparatus, the general form and structure of the upper jaw, and in the nature and alveolar lodgement of the teeth. The peculiarities of structure referable to the special exigencies of the extinct form of Saurian under consideration, were also dwelt upon, and, lastly, those which characterized the species described, and which illustrate its more immediate affinities.

ROYAL SOCIETY OF EDINBURGH.

April 9th.—Dr. Abercrombie, V.P., in the Chair.

Sir Charles Bell read a paper “On the Comparison of the Nerves of the Spine with those of the Encephalon.” (Part ii.)

As this paper bears more directly on physiology than zoology we shall be the more brief. This part is chiefly occupied with the *portio dura* of the 7th pair of nerves of the brain, which is peculiar in its function, origin, and distribution. Instead of investigating its functions by experiments, the author stated it could be more humanely done by attentive observation on the living, and still more on the dying; it is pre-eminently a muscle of respiration, and its influence was conspicuous on the countenance through the process of dissolution to the last sigh; also in the highest state of excitement, mental and bodily, and in the state of greatest repose. Though not a nerve of pure sensation or volition, but of respiration, and although the

system to which it belonged at first appeared confused, yet still there was method in the complexity. Through nearly the whole animal series, its agency might be traced from the most simple up to the most complicated; in those instances where respiration was performed only by the air playing upon the surface; by its being admitted into some simple sac, or into tubes, or by then leading to viscera. Even after this, it became associated with other functions, as of taste, smell, speech, &c. No wonder then that it was complex; both vital and voluntary actions being most closely associated with it. For example, the throat was a common passage for respiration and deglutition; and how admirable that there is so little interference! Directions were given for tracing the *portio dura* from the surface to its true origin, in a flat layer spreading out on the *pons Varolii* or *nodus cerebri*; its relation to the spinal cord was then shown, as that of other nerves, the 8th, 6th, and 4th; its cause and distribution was then stated, corresponding to its varied functions, on the lips and other parts connected with speech, on expression generally, the play of the features, not excluding the eye. That every fibre and aperture of the countenance is associated with respiration, is now too clear to be disputed; direct experiments, as well as many of the phenomena of health, and yet more of disease, most strikingly demonstrate it. It acts in laughter, not negatively, or as the result of defective influence, but positively; so in extreme pain, in passion, &c. In his next paper the author means to point out in what respects this nerve differs from others.

Dr. Macdonald made a verbal communication on the Osseous Structure of Fishes.

The author had scarcely time to do justice to himself or subject, and we have still less in our limited space. He stated he thought zoologists attended too little to anatomy, those especially who gave themselves to tracing analogies throughout the scale of animated nature. He avowed himself an advocate for the quaternary not the quinquenary grouping of the series. His attention was first directed to the structure of fishes, when comparing the fourth or last portion of the first great circle, viz. the vertebrata, with insects. The analogies here were striking, but great mistakes are generally committed regarding them. Starting from the views propounded by Carus, of three important portions being fundamental, and which, in ascending, are converted into the jaws, the limbs, wings, &c. he traced these modifications through the series. Entomologists have almost universally erred in establishing analogies with the more complicated classes of animals. They state that the lower part of the anterior

portion of the body corresponds with the sternum of the vertebrata ; whereas in insects there is a complete inversion. This lower part to which the limbs are attached does not correspond with the sternum but with the back. Then the internal viscera should be viewed in this same relation ; they lie upon or are *above* the back, and are truly *epigastric* not *hypogastric*. When furnished with wings, if with two pair, the anterior proceed from the true thoracic arch, the posterior from the pelvic. In the turtle the three arches are beautifully seen ; the *pro-thoracic* in the jaw, then the *thoracic*, and finally the *meta-thoracic* or pelvic. In this group, as in some of the neighbouring ones, from the peculiar arrangement of the pelvic and other bones, the heel is turned forwards and the toes backwards. In fishes M. Geoffroy St. Hilaire attempted to establish an analogy between the bones of the operculum and the ossicula of the ear. But this is quite wrong : these bones are nothing more than a peculiar arrangement of the thoracic arch and fore-arm, as may be seen in the osseous arrangement, in its connexion with the respiratory function in the gills. The *Proteus* when viewed in its compound character presents no exception. Again, not a less common, though equally glaring mistake is made with regard to the pectoral fin and the deeper seated parts connected with it. Proceeding upon analogical considerations, the bones have been designated the scapular, proscapular, humerus, &c., whereas the true analogy of these parts is not with the shoulder but with the pelvic limb. As the osseous system, correctly contemplated, demonstrates this, so do the soft parts, and more especially the nerves, whether we look at the nerves of sensation or motion, or the *portio dura* of the 7th. The prothoracic arch, as already stated, is found in the jaw, and here the analogy is as conspicuous as elsewhere. On looking at the skeleton of the *Lophius* there appeared to be a contradiction, for here we find something so like a fin or hand, that it cannot fail to be taken for it ; but in seeking for it in the recent specimen it is not to be found ; in truth it is so rudimentary, that it never reaches, far less protrudes from, the skin. These are merely a few hints upon a very extensive and interesting subject, which the author would do well to illustrate in a more systematic and satisfactory manner than was possible in a short verbal communication.

ROYAL IRISH ACADEMY.

May 28, 1838.—Sir W. Hamilton, A.M., President, in the Chair.

Mr. Ball read a paper, by Wm. Thompson, V.P., Nat. Hist. Society of Belfast, "On the Irish Hare." (*Lepus Hibernicus*.)